

# Risks and Adaptation Strategies for Disaster Readiness: Basis for School Sustainability Plan

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**Abstract**— This study was conducted to determine the risks and adaptation strategies for disaster readiness as a basis for the school sustainability plan of eight (8) medium public elementary schools in Licab District, Nueva Ecija with the use of descriptive-correlational research design. A total of 103 employees served as respondents of the study.

The yearly disasters encountered by the school employees are floods and typhoons. They are aware of flood risks thus, they always ensure the safekeeping of school records. As to their experience in a typhoon, "their understanding of the warning signal was very evident and always adopt measures of disaster prevention and facilitate the immediate resumption of classes. In their risk adaptation strategies, the respondents prepare the best response during an emergency, they know the emergency hotline numbers, they are aware of the emergency evacuation plan and they actively joined any disaster prevention, relief action, or emergency drill.

As to their knowledge about the disaster, the respondents always get information from TV or Radio, electronic messages (Mobile SMS, etc.), and social networking sites (e.g. Facebook, Twitter). In terms of their readiness, they claimed that they always: have medication and first aid kit ready and store emergency kits or Go bag (including documents, water, foods, flashlight or candle, radio, cellphone, rope and etc.). The risk adaptation strategies of the respondents were positively related to their disaster readiness which implies that activities such as conducting drills, emergency plans, and attending seminars and trainings increase the preparedness for a disaster of the respondents.

**Keywords**— Adaptation strategies, disaster readiness, emergency, school employees, sustainability plan.

## I. INTRODUCTION

The Philippines is exposed to disasters and hazards [1] because of its geographical and geological position. "It has been ranked third (3<sup>rd</sup>) among 173 countries in terms of exposure to hazards, such as typhoon, earthquake, flooding, landslide, volcanic eruption, and tsunami, according to the World Risk Index 2012 released by the United Nations International Strategy for Disaster Reduction [2]". In the R.A. 10121 Orientation Seminar conducted by the Office of Civil Defense, it was presented that the Philippines' location along the Pacific Typhoon Belt makes it more prone to

typhoons or hydro-meteorological hazards. Based on the 2002 to 2012 data of the National Disaster Risk Reduction and Management Council (NDRRMC), the country experiences an average of twenty (20) typhoons a year, and 50% of it has damaging effects on lives and properties. At the same time, the Philippines is also situated along the Pacific Ring of Fire which makes it susceptible to earthquakes and volcanic eruptions. These risks prompted the Philippine Disaster Management System to undertake a paradigm shift. From Presidential Decree 1566 to Republic Act 10121, from reactive to pro-active, from top-down and

centralized management to bottom-up and participatory disaster risk reduction process [3].

"Republic Act 10121, also known as the Philippines Disaster Risk Reduction and Management (DRRM) Act of 2010, is an Act focusing on strengthening the Philippine Disaster Risk Reduction and Management System". Through this Act, the National DRRM Framework (NDRRMF) and National DRRM Plan (NDRRMP) were developed. Both the NDRRMF and NDRRMP foresee a country which has "safer, adaptive and disaster-resilient Filipino communities toward sustainable development". Together with the paradigm shift is the creation of the four thematic areas namely; a) Disaster Prevention and Mitigation, b) Disaster Preparedness, c) Disaster Response, and d) Disaster Rehabilitation and Recovery [4].

The performance of each locality, city, or municipality in preventing the adverse impacts of hazards and related disasters, counts on the way local government units, in particular, have prepared for disaster possibilities in their respective jurisdictions. "Contingency planning is actually a fundamental tool, but a good plan cannot stand alone without having an empowered citizenry, infrastructures, emergency response mechanisms, rehabilitation, and other important logistics" [5]. According to authors in [6] "a focus on service-delivery is important in the local government because it represents the public face of the state and is where citizens' experience of government is derived on a day-to-day basis".

Therefore, this study was conducted to hopefully improve the current strategies and preparedness that are being implemented in the event that any disaster occurs. Also, to develop a new plan of strategies based on the findings and observations which can be useful for everyone. Through this, the respondents may be given sufficient, meaningful, and

empirical basis in disaster readiness and adaptation strategies. Moreover, this may help enhance, enrich, and develop preparedness for disasters.

## II. METHODOLOGY

This study used a descriptive-correlational research design with 103 personnel from eight (8) medium public elementary schools in Licab District, Nueva Ecija, Philippines served as respondents. According to [7], as cited by [8], "Correlational research is employed to test the degree of relationship between two variables". The researchers assessed the risks, adaptation strategies and disaster readiness of the schools using a Likert-scale questionnaire and the result served as a basis for the school sustainability plan. Frequency count, percentage, weighted mean, and correlational formulas were utilized to perform statistical computations of the data gathered.

## III. RESULTS AND DISCUSSION

### 1. Annual Disaster Encountered by the Employees

The yearly disasters encountered by the school employees are floods and typhoons. According to the respondents, they are always aware of flood risks (WM=3.78), thus, always ensure the safekeeping of school records. As to their experience in a typhoon, "their understanding of the warning signal was very evident (WM = 3.85) and therefore, always adopt measures of disaster prevention and facilitate the immediate resumption of classes. The results indicate that respondents are always ready during floods and typhoons. This preparedness can be noted due to their experiences.

### 2. Schools Disaster Risk Reduction Management (DRRM) Adaptation Strategies

Table 1. School DRRM Adaptation Strategies

Conducting Mock Drills	Mean	VD
I prepare the best response during an emergency	3.65	Always
I am providing the best strategy without any panic	3.45	Always
I give an opportunity to practice emergency procedures in a simulated but safe environment	3.56	Always
I implement mock drill experiences	3.62	Always
I conduct mock exercise or emergency drill	3.58	Always
<b>Overall Weighted Mean</b>	<b>3.57</b>	<b>Always</b>

Emergency Evacuation Plan	Mean	VD
I am aware of the emergency evacuation plan	3.69	<i>Always</i>
I know the emergency hotline numbers	3.72	<i>Always</i>
I am aware of the local emergency plans	3.62	<i>Always</i>
I review any existing emergency plans to incorporate what's worked in the past	3.53	<i>Always</i>
I identify evacuation routes	3.57	<i>Always</i>
<b>Overall Weighted Mean</b>	<b>3.63</b>	<b><i>Always</i></b>
Seminars and Trainings	Mean	VD
I attend seminar/training/drills about disaster risk reduction management	3.46	<i>Always</i>
I actively joined any disaster prevention, relief action or emergency drill	3.50	<i>Always</i>
I increase my training and drills	3.47	<i>Always</i>
I conduct a risk assessment to prioritize various scenarios	3.44	<i>Always</i>
I conduct a relational training about disaster risk reduction management (DRRM)	3.44	<i>Always</i>
<b>Overall Weighted Mean</b>	<b>3.46</b>	<b><i>Always</i></b>

## 2.1 Conducting Mock Drills

The table shows that the overall weighted mean for the conduct of mock drills was 3.57, which meant that the respondents "always" apply these strategies inside the school. The data further revealed that the item "*I prepare the best response during an emergency*" had the highest weighted mean of 3.65 verbally interpreted as "always". The lowest item is on "*Providing best strategy without panic*" with a weighted mean of 3.45 which was also interpreted as "always". Preparedness activities have the potential to enhance response and improve operations as long as the context of disaster is properly considered, because different types of disasters require different types of the response given the varying features of each type of hazard [2].

## 2.2 Emergency Evacuation Plan

It can be gleaned from the table that the overall weighted mean was 3.63 and was verbally interpreted as "always". The data also reveals that the item "*I know the emergency hotline numbers*" had the highest weighted mean of 3.72 verbally interpreted as "always". followed by the item "*I am aware of the emergency evacuation plan*" WM 3.69. verbally interpreted as "always". As all the items indicated were interpreted as "always", it implies that all respondents know what to do during a disaster.

## 2.3 Seminars and Trainings

Exchanging information at all levels of the society through symposia, workshops, seminars, and training can increase the intensity of awareness and participation of the communities in the prevention and preparedness programmed [9]. The result showed that the item "*I actively joined any disaster prevention, relief action or emergency drill*" had the highest weighted mean of 3.50 verbally interpreted as "always". The donor base for disaster relief today is more diverse than ever before, and the amount of philanthropic funding being directed toward disaster relief has increased significantly. For a response to disasters to be as swift and efficient as possible, the financial aspect is very important. Information sharing can retain the skills learned and will make us ready when facing disaster [10].

## 3. Disaster Readiness

In terms of knowledge of about disaster, the respondents always get information from TV or Radio (WM =3.89), electronic messages (Mobile SMS, etc.) directly for individuals (WM=3.78), social networking sites (e.g. Facebook, Twitter) (WM=3.75) and official weather bulleting (WM=3.75). As to their readiness, the respondents claimed that they always: "*have medication and first aid kit ready* (WM=3.74)" and "*store emergency kits or Go bag*"

(including documents, water, foods, flashlight or candle, radio, cellphone, rope and etc.) (WM=3.72)".

#### 4. Relationship between DRRM Adaptation Strategies and Disaster Readiness

Table 2 shows the relationship between disaster risk reduction management (DRRM) adaptation strategies and disaster readiness. This means that DRRM in terms of conducting mock drills, emergency evacuation plans and seminars and trainings are significantly related to disaster readiness and therefore, the null hypothesis was rejected.

Table 2. Relationship Between DRRM Adaptation Strategies and Disaster Readiness

DRRM Adaptation Strategies	Disaster Readiness
	r
Conducting Mock Drills	.552**
	p-value
	0.000
	r
Emergency Evacuation Plan	.375**
	p-value
	0.000
	r
Seminars and Trainings	.432**
	p-value
	0.000

#### Proposed Sustainability Plan

OBJECTIVES	KEY ACTIVITIES	PERSON INVOLVED/ RESOURCES	TIME FRAME	SUCCESS INDICATOR
1. To demonstrate understanding and awareness of disaster readiness and its importance among employees	-Drop, Cover and Hold -Forums about disaster preparedness and disaster warning -DRRM Training	Teachers, School Head, Resource Speaker, and LGU	Quarter 1-2 S.Y 2020-2021	Integrate a more realistic perception of risks into their materials and curricula
2. To increase knowledge of protective behaviors.	Trainings and simulation exercises on disaster preparedness and response	Teachers, School Head, Resource Speaker, and LGU	Quarter 1-2 S.Y 2020-2021	Improves the skills of the employees to drills and participate in the accomplishment of their goal
3. To further increase understanding of disaster readiness and appropriate strategies for employees	-Seminar/ Training/ Drills about DRRM -Role-playing of response operations	Teachers, School Head, Resource Speaker, and LGU	Quarter 2-3 S.Y 2020-2021	Learning and practicing skills that may be useful during an emergency

This implies that activities such as conducting drills, emergency plan and attending seminars and trainings related to disaster increases the readiness to a disaster of the respondents. This cluster of activities includes learning and practicing skills that may be useful during an emergency. Such activities include practicing "drop, cover, and hold on," practicing household evacuation plans, and learning how to assist special-needs populations such as infants, elderly individuals, and those with disabilities [9]. Promoting acquisition, storage, and maintenance of disaster survival items is often the focal activities in preparedness campaigns. Lists of essential supplies and equipment are available from several sources, including the Red Cross and government agencies [9]. Training should also be given to workers in the focused area where flood usually occurs during the rainy season. This initiative will also enhance the knowledge and make the workers aware of how to prevent and what are to be done in real situations.

#### 5. Proposed Sustainability Plan

##### Rationale:

A proposed sustainability plan for disaster readiness is anchored on the result of the responses of the respondents of eight (8) medium public elementary schools in Licab District. In addition, the proposed plan entails the school profile, disaster risks, and DRRM adaptation strategies.

4. To make an access plan that addresses the safety of everyone	-Identify evacuation routes -Identifying the hotline numbers -Emergency evacuation plan -Development or enhancement guidelines for emergency response teams	Teachers, School Head, and LGU	Quarter 2-3 S.Y 2020-2021	Makes a decision to evacuate or not depends on the perception of danger
5. To continue the assessment of the strengths and weaknesses of the sustainability plan	Risk assessment to prioritizing various scenarios	School Heads, Monitoring and Evaluation Coordinator and Teachers	Quarter 3-4 S.Y 2020-2021	To become prepare on how they can protect themselves, and the cost of various readiness actions
6. To strengthen further the partnership and coordination among all key players and stakeholders	Formulate coordination mechanism and guidelines for partnership arrangements in the contingency plan	Stakeholders, Teachers, and School Heads	Quarter 1-4 S.Y 2020-2021	Partnerships arrangement among stakeholders established

#### IV. CONCLUSIONS AND RECOMMENDATIONS

In the light of the findings, the following conclusions and recommendations were drawn: The respondents were always prepared for a disaster such as: being aware of the flood risks and also understand the typhoon warning signal. The respondents always apply the Disaster Risk Reduction Management (DRRM) Adaptation Strategies such as: preparing the best response during an emergency, knowing the emergency hotline numbers, and actively join any disaster prevention, relief action, or emergency drill. In Disaster Readiness, they follow the official weather bulletin and having medication and first aid kit ready. There is a significant relationship between disaster risk reduction management (DRRM) adaptation strategies and disaster readiness. Based on the summary of findings and conclusions, the following recommendations are offered: 1). Employees must continue to be more creative, innovative, and resourceful in devising improvised materials to help promote effective readiness in case of disaster. 2.) Teachers must continue to be guided and be familiar with various kinds of adaptation strategies that they can use inside and

outside the classroom. Seminars, workshops, and in-service trainings should continue to be provided by the school heads to uplift employees' disaster readiness and appropriate coordination with community and government authorities, and a better flood prevention plan should be implemented by the Local Government Units [11].

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